

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 3412 (1994): Electric water boilers [ETD 32: Electrical Appliances]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE



भारतीय मानक
बिजली के पानी के बायलर — विशिष्ट
(दूसरा पुनरीक्षण)

Indian Standard

ELECTRIC WATER BOILERS — SPECIFICATION
(*Second Revision*)

UDC 641.542.1-83

© BIS 1994

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

March 1994

Price Group 1

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Electrical Appliances Sectional Committee had been approved by the Electrotechnical Division Council.

This standard covers the general safety and performance requirements of electric water boilers.

This standard was originally published in 1965 and was first revised in 1985. As per the decision of the third meeting of Electrotechnical Division Council, a separate safety standard on electric water boiler has been brought out. In the second revision of this composite standard, instead of giving details of safety requirement, reference has been made to safety standard, IS 302-2-204 (1993). The details of the safety requirements are covered in IS 302-2-204 (1993).

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

ELECTRIC WATER BOILERS — SPECIFICATION

(*Second Revision*)

1 SCOPE

1.1 This standard covers the general safety and performance requirements of electric water boilers of rated load not exceeding 5.0 kW and for connection to supplies at voltage not exceeding 250 V ac single phase 50 Hz or dc.

1.2 In addition to **1.1**, the provisions of **1.2** of IS 302-2-204 (1993) shall also apply.

2 REFERENCES

2.1 The following Indian Standards are necessary adjuncts to this standard:

<i>IS No.</i>	<i>Title</i>
302-1 (1979)	Safety of household and similar electrical appliances: Part 1 General requirements (<i>fifth revision</i>)
302-2-204 (1993)	Safety of household and similar electrical appliances: Part 2 Particular requirement, Section 204 Electric water boiler

3 TERMINOLOGY

3.1 Clause 2 of IS 302-2-204 (1993) shall apply.

4 GENERAL REQUIREMENTS

4.1 Clause 3 of IS 302-2-204 (1993) shall apply.

5 GENERAL NOTES ON TESTS

5.1 Clause 4 of IS 302-2-204 (1993) shall apply.

6 RATING

6.1 Clause 5 of IS 302-2-204 (1993) shall apply.

7 CLASSIFICATION

7.1 Clause 6 of IS 302-2-204 (1993) shall apply.

8 MARKING

8.1 Clause 7 of IS 302-2-204 (1993) shall apply.

8.2 The electric water boiler may also be marked with the Standard Mark.

8.2.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

9 SAFETY REQUIREMENTS

9.1 The electric water boiler shall comply with the requirements given in 8 to 32 of IS 302-2-204 (1993).

10 TEST FOR CAPACITY

10.1 The water capacity of the water boiler shall not be less than 95 percent of the rated water capacity declared by the manufacturer, and it shall be possible to boil without splashing an amount of water equal to 85 percent of the rated water capacity at rated input [see 5.2.3 of IS 302-2-204 (1993)].

11 TEST FOR THERMAL EFFICIENCY

11.1 The water boiler is filled with water corresponding to its rated capacity and is allowed to stand for a period of 15 minutes in a room free from draught and the temperature of water noted. It is then switched on with the circuit adjusted to give rated input till water temperature is nearly 50°C above the initial temperature of water. The period for which the supply is connected shall be noted. The maximum temperature attained by the water shall also be measured.

The thermal efficiency shall not be less than 85 percent for water boilers incorporating immersion type heating element and 65 percent for water boilers incorporating clamp on type heating element.

11.2 In case the thermal efficiency marked on the water boiler is more than that specified in **11.1**, a tolerance of a 10 percent shall be allowed on this value subject to the provision that the actual efficiency shall, in no case, fall below the value given in **11.1**.

12 ENDURANCE TEST

12.1 The water boiler is filled to 80 percent of the rated capacity. It is connected to the supply such that the input is 1.15 times the rated input

which is maintained throughout the test. The water boiler is operated for 96 operating hours. Occasional addition of water to compensate evaporation losses is recommended.

12.1.1 After the test of **12.1** the water boiler shall withstand the electric strength test as given in **16.4** of IS 302-1 (1979).

13 FINISH

13.1 The external finish used on metal components shall be of a heat and moisture resisting nature and shall not be adversely affected by variation in temperature occurring under normal operating conditions or after the endurance test.

Compliance shall be checked by visual inspection or after the endurance test (*see 12*).

14 TESTS

14.0 Categories of Tests

Tests are classified as type, acceptance and routine tests.

14.1 Type Tests

The tests specified in Table 1 below shall constitute the type tests and shall be carried out on two samples of electric water boilers of the same type and rating selected preferably at random from regular production lot. Before commencement of the tests, the water boilers shall be visually examined and inspected for obvious visual defects in respect of components parts and their assembly, construction, stability, markings, provision of suitable terminals for supply connections, earthing and the effectiveness of screws and connections. The external surface finish shall be even and free from finishing defects.

Table 1 Schedule of Type Tests

Sl No.	Test	Clause Reference
i)	Safety requirements	8 to 32 of IS 302-2-204 (1993)
ii)	Test for capacity	10
iii)	Test for thermal efficiency	11
iv)	Endurance	12
v)	Finish	13

14.1.1 Criteria of Acceptance

Both samples shall successfully pass all the type tests for proving conformity with the require-

ments of the standard. If any of the samples fails in any of the type tests, the testing authority, at its discretion, may call for fresh samples not exceeding twice the original number and subject them again to all tests or to the test(s) in which failure(s) had occurred. No failure should be permitted in the repeat test(s).

14.2 Acceptance Tests

The following shall constitute the acceptance tests:

Test	Clause Reference
a) Protection against electric shock	8 of IS 302-2-204 (1993)
b) Input	10 of IS 302-2-204 (1993)
c) Temperature-rise	11 of IS 302-2-204 (1993)
d) Insulation resistance and electric strength at operating temperature	13 of IS 302-2-204 (1993)
e) Moisture resistance	15 of IS 302-2-204 (1993)
f) Insulation resistance and electric strength (after humidity treatment)	16 of IS 302-2-204 (1993)
g) Provision for earthing	27 of IS 302-2-204 (1993)
h) Capacity	10

14.2.1 A recommended sampling procedure for acceptance tests is given in Annex B of IS 302-1 (1979).

14.3 Routine Tests

The following shall constitute the routine tests:

Test	Clause Reference
a) Protection against electric shock	8 of IS 302-2-204 (1993)
b) High voltage	13.2.2 of IS 302-1 (1979)
c) Provision for earthing	27 of IS 302-2-204 (1993)

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 1986* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Director (Publications), BIS.

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Handbook' and 'Standards Monthly Additions'.

This Indian Standard has been developed from Doc : No. ETD 32 (3734).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all offices)

Regional Offices :

Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	{ 37 84 99, 37 85 61 37 86 26, 37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	{ 53 38 43, 53 16 40 53 23 84
Southern : C. I. T. Campus, IV Cross Road, MADRAS 600113	{ 235 02 16, 235 04 42 235 15 19, 235 23 15
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) BOMBAY 400093	{ 632 92 95, 632 78 58 632 78 91, 632 78 92

Branches : AHMADABAD. BANGALORE. BHOPAL. BHUBANESHWAR.
COIMBATORE. FARIDABAD. GHAZIABAD. GUWAHATI. HYDERABAD.
JAIPUR. KANPUR. LUCKNOW. PATNA. THIRUVANANTHAPURAM.